Advanced Coordinated Control, Formation Flying for Nano-Satellite Applications

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The official link for this solicitation is:
http://www.acq.osd.mil/osbp/sbir/solicitations/sbir20152/index.shtml

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Description:
The focus and priority of this topic is seeking innovative space-based remote sensor capabilities supporting all-weather, day-night imaging capability. Preliminary research assessments highlight the availability of next generation device/component technologies and outline novel approaches for creating flotillas, swarms, and/or formations of nano-satellites with multi-faceted functions and sensor capabilities. While each individual satellite should have a specific sensor or control function, the overall formation/swarm should have a greater function and be “greater than the sum of its parts.” Of particular interest are solutions with multiple onboard processing computer clusters, very high bandwidth communications architectures, imagery collection/dissemination, SAR/ISAR, MASINT, and GPS alternatives. Current small satellites such as cubesats are limited with power due to size and weight issues. Of particular interest is new power storage, collection, handling, and distribution concepts that will enable higher power components for communications and active sensors. Power requirements for a distributed aperture RF/EO system must be determined in order to develop a flotilla craft design. Solutions should target the goals defined here and should be scalable across a network of mobile ground, air, sea, and space devices. PHASE I: Research and develop novel approaches to demonstrate the feasibility of the end goal of performing distributed RF/EO apertures using nano-satellites. The Phase I effort should consist of a study effort to determine if current nanosat capabilities can be implemented to demonstrate this goal from low Earth orbit. Assess through analysis the Technology Readiness Level (TRL) of the proposed concept at the conclusion of

Phase I. PHASE II: Based on the verified successful results of Phase I, refine and extend the proof-of-concept design into a fully functioning pre-production prototype. Verify the TRL at the conclusion of Phase II. PHASE III: Develop the prototype into a comprehensive solution that could be used in a broad range of military and civilian applications where rapid RF/EO imagery is required. There are no particular requirements on data resolution at this time. This demonstrated capability will benefit and have transition potential to Department of Defense (DoD) weapons and support systems, federal, local and state organizations as well as commercial entities. For instance, a swarm of commercial nanosatellite sensors could be used to monitor crops, roadways, etc. or a team of floating EO sensors could be deployed in waterways to inspect the integrity of dams and levees, or to monitor the smuggling of illegal contraband in US waters.